DETAILED ACTION

Response to Amendment

Amendments filed on 07/16/2008 have been entered into prosecution and considered in this office action. The amendments removes the spelling errors from the previous claims and the corresponding claim objections are withdrawn.

Response to Arguments

1. Applicant's arguments, see applicant's remark, filed 07/16/2008, with respect to the 35 USC 112 rejection have been fully considered and are persuasive. The 35 USC 112 first paragraph rejection of claims 2 and 23 has been withdrawn. This office action is therefore non-final since previous action did not include prior art rejections for claims 2 and 23.

2. Applicant's arguments filed 07/16/2008 regarding prior art rejections have been fully considered but they are not persuasive.

Regarding the applicant's argument, the applicant first argues that Sabry does not teach a non-linear admissible region "that contains a set of traffic mixes that fulfill a given overload requirement" and that the non-linear admissible region has dimensions that "are the number of connections in…respective service classes". However, as shown in the previous, Sabry does disclose the set of traffic mixes which are shown as the number of connections shown in the x-axis of Fig. 5. Sabry shows the overload requirement as being the exceeding of the bandwidth, as shown in the previous action.

That is, Fig. 5 shows a non-linear admissible region that contains a set of traffic mixes that fulfill the overload requirement of not exceeding the bandwidth. Fig. 2 and 3 show that the system compares the equivalent bandwidth approximated in Fig. 5 and compares the equivalent bandwidth with the maximum allowed bandwidth to see if the maximum allowed bandwidth would be exceeded. Sabry also shows “the number of connections in …respective service classes” in Fig. 5 (x-axis, which represents the number of connections) and Fig. 2, block 110 (wherein the QoS, or the service class parameters are taken into account in determining the equivalent bandwidth).

The applicant then argues that Andrews does not show the checking function being performed "for each of a number of service classes, whether [the] traffic mix is contained within a class-specific delay-limited admissible region…" However, as shown by the previous office action, Fig. 4 shows a check of a linear admissible region that represents the number of connections for each traffic classes that may be allowed. The previous action also cites a passage saying that “The admissible region consists of operating points for which the probability of violating a delay bound…” as cited in the abstract and column 2, lines 49-57. That is, the linear region shown in Fig. 4 is used to check for each of the service classes (class I and II in this figure) whether the traffic mix is contained with the class-specific region that the "probability of violating the delay bound is below a threshold”.

Lastly, the applicant argues that the combination of Sabry, Andrews and Racz is subjected to hindsight. However, as shown in the previous office action, Racz does show a function that takes into account both a capacity limitation (which may be represented by the capacity function of Sabry's invention) and a delay limitation (which may be represented by the delay-bounded linear region method of Andrews' invention). That is, Racz shows that the two types of admission checks may both be used in order to provide a more through and robust checking method, thus making the combination obvious to one of the ordinary skill in the art.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claim 1, 19, 22 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sabry (US 6,628,612) in view of Andrews (US 6,771,598) and Racz (US 2002/0176360).

Sabry discloses a derivation of equivalent bandwidth of an information flow including the following features.

Regarding claim 1, a method for controlling admission of a new connection onto a transport link in a communication network (see “connection admission controller” recited in the abstract), said method comprising the steps of: checking whether a multi-service class traffic mix (see “several different traffic classes” recited in column 2, lines 50-51) defined by previous admitted connections present on said link together with said new connection (see “equivalent bandwidth be determined both for the new connection and for the existing connections” recited in column 1, lines 19-22) is contained within an overload-limited admissible region (see “whether admission would cause a bandwidth used to exceed a maximum bandwidth allowed” recited in the abstract; exceeding the bandwidth is the overload condition) defined as a non-linear (see “having a non-linear relationship to the number of connections” recited in the abstract) that contains a set of traffic mixes that fulfill a given overload requirement, where the dimensions of said non-linear admissible region are the number of connections in the respective service classes (see Fig. 5, which shows a figure relating equivalent bandwidth and number of connections; and see Fig. 2, which shows the comparison between the equivalent bandwidth and maximum allowed bandwidth).

Regarding claim 22, an admission controller for controlling admission of a new connection onto a transport link in a communication network (see “connection admission controller” recited in the abstract), said admission controller comprising: means for checking whether a multi-service class traffic mix (see “several different traffic classes” recited in column 2, lines 50-51) defined by previous admitted connections present on said link together with said new connection (see “equivalent bandwidth be determined both for the new connection and for the existing connections” recited in column 1, lines 19-22) is contained within an overload-limited admissible region (see “whether admission would cause a bandwidth used to exceed a maximum bandwidth allowed” recited in the abstract; exceeding the bandwidth is the overload condition) defined as a non-linear (see “having a non-linear relationship to the number of connections” recited in the abstract) that contains a set of traffic mixes that fulfill a given overload requirement, where the dimensions of said non-linear admissible region are the number of connections in the respective service classes (see Fig. 5, which shows a figure relating equivalent bandwidth and number of connections; and see Fig. 2, which shows the comparison between the equivalent bandwidth and maximum allowed bandwidth).

Sabry does not disclose the following features: regarding claim 1, checking, for each of a number of said service classes, whether said traffic mix is contained also within a class-specific delay-limited admissible region approximated as a linear admissible region that contains a set of traffic mixes that fulfill a given class specific delay requirement, where the dimensions of said linear admissible region are the number of connections in the respective service classes; and said new connection for transport over said transport link only if said traffic mix is contained within an intersection of said non-linear overload-limited admissible region and said linear delay-limited admissible region(s); regarding claim 19 and 40, wherein said communication network is a transport network based on the Universal Terrestrial Radio Access Network (UTRAN); regarding claim 22, means for checking, for each of a number of said service classes, whether said traffic mix is contained also within a class-specific delay-limited admissible region approximated as a linear admissible region that contains a set of traffic mixes that fulfill a given class specific delay requirement, where the dimensions of said linear admissible region are the number of connections in the respective service classes; and means for admitting said new connection for transport over said transport link only if said traffic mix is contained within an intersection of said non-linear overload-limited admissible region and said linear delay-limited admissible region(s);

Andrews discloses a method of admission control for packetized communication networks including the following features.

Regarding claim 1,checking, for each of a number of said service classes, whether said traffic mix is contained also within a class-specific delay-limited admissible region approximated as a linear admissible region (see linear admissible region shown in Fig. 4) that contains a set of traffic mixes that fulfill a given class specific delay requirement (see "The admissible region consists of operating points for which the probability of violating a delay bound for any packet is below a threshold), where the dimensions of said linear admissible region are the number of connections in the respective service classes (see Fig. 4, where the dimension is shown as the number of connections within two separate service classes).

Regarding claim 22, means for checking, for each of a number of said service classes, whether said traffic mix is contained also within a class-specific delay-limited admissible region approximated as a linear admissible region (see linear admissible region shown in Fig. 4) that contains a set of traffic mixes that fulfill a given class specific delay requirement (see "The admissible region consists of operating points for which the probability of violating a delay bound for any packet is below a threshold), where the dimensions of said linear admissible region are the number of connections in the respective service classes (see Fig. 4, where the dimension is shown as the number of connections within two separate service classes).

Racz discloses a method of facilitating reliable connection admission control for telecommunications system using AAL2 signaling including the following features.

Regarding claim 1, wherein said new connection for transport over said transport link only if said traffic mix is contained within an intersection of said non-linear overload-limited admissible region (discussed above in Sabry, a total bandwidth-based admission limitation) and said linear delay-limited admissible (discussed in above in Andrews, a delay-based admission limitation) region(s) (see “denote the CAC function by f(C, QoS…)…C is the capacity of the ATM VCC…QoS is the delay requirement in milliseconds” recited in paragraph [0074], which shows both the capacity limitation and the delay limitation is taken into account in deciding whether to admit the new connection).

Regarding claim 19 and 40, wherein said communication network is a transport network based on the Universal Terrestrial Radio Access Network (UTRAN) (see "UTRAN" recited in paragraph [0009]).

Regarding claim22, means for admitting said new connection for transport over said transport link only if said traffic mix is contained within an intersection of said non-linear overload-limited admissible region (discussed above in Sabry, a total bandwidth-based admission limitation) and said linear delay-limited admissible (discussed in above in Andrews, a delay-based admission limitation) region(s) (see "denote the CAC function by f(C, QoS…)…C is the capacity of the ATM VCC…QoS is the delay requirement in milliseconds" recited in paragraph [0074], which shows both the capacity limitation and the delay limitation is taken into account in deciding whether to admit the new connection).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Sabry using features, as taught by Andrews and Racz, in order to ensure QoS contract of all connections being transmitted on the link as well as preventing data loss due to link overloading.

4. Claims 2 and 23 rejected under 35 U.S.C. 103(a) as being unpatentable over Sabry, Andrews and Racz as applied to claims 1 and 22 above, and further in view of Shum (US 5,963,542).

Sabry, Andrews and Racz disclose the claimed limitations.

Andrews also discloses the following features.

Regarding claims 2 and 23, wherein said delay-limited region is approximated as a linear region for a multi-service-class traffic mix (see Fig. 4, wherein the linear region is approximated for traffic mix of class I and II).

Sabry, Andrews and Racz do not disclose the following feature: regarding claim 2 and 23, wherein the multi-service-class traffic mix is generally modeled as a superposition of periodic on-off connection.

Shum discloses an asynchronous transfer mode cell loss estimator including the following features.

Regarding claim 2 and 23, wherein the multi-service-class traffic mix is generally modeled as a superposition of periodic on-off connection (see “superposition of three exemplary traffic streams…of the correlated burst on-off traffic sources” recited in column 7, lines 54-65, wherein, as shown in Fig. 7, the correlated on-off traffic streams also appear periodic).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Sabry, Andrews and Racz using features, as taught by Shum, in order to approximate the multiplexer model (see Shum column 7, line 58-67).

5. Claim 3, 10, 24 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sabry, Andrews and Racz as applied to claim 1 and 22 above, and further in view of Beshai (US 5,881,049).

Sabry, Andrews and Racz disclose the claimed limitations.

Sabry, Andrews and Racz do not disclose the following features: regarding claim 3 and 24, wherein said overload-limited admissible region contains the set of traffic mixes for which the probability of temporarily overloading a queuing system associated with the transport link is smaller than a given target value; regarding claim 10 and 31, wherein said class-specific packet delay requirement requires that the probability of the class-specific delay being larger than a given class-specific maximum delay is smaller than a given target value.

Beshai discloses an admission control in an ATM switching node including the following features.

Regarding claim 3 and 24, wherein said overload-limited admissible region contains the set of traffic mixes for which the probability of temporarily overloading a queuing system (see "probability of buffer overflow…" recited in column 5, line 57-58) associated with the transport link is smaller than a given target value (see equation 8 in column 7, line 43-49, which shows the probability must be less than the natural logarithm of the QOS).

Regarding claim 10 and 31, wherein said class-specific packet delay requirement requires that the probability of the class-specific delay being larger than a given class-specific maximum delay is smaller than a given target value (see "delay threshold…should not be exceed by more than a specified probability…" recited in column 8, line 53-62).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Sabry, Andrews and Racz using features, as taught by Beshai, in order to ensure the QoS contract regarding packet loss could be satisfied.

6. Claim 4 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sabry, Andrews and Racz as applied to claim 1 and 22 above, and further in view of Knightly (US 6,801,501).

Sabry, Andrews and Racz disclose the claimed limitations.

Sabry, Andrews and Racz do not disclose the following feature: regarding claim 4 and 35, wherein said step of checking whether said traffic mix is contained within said non-linear overload-limited admissible region is representative of checking whether or not said traffic mix violates a delay requirement related to packet loss caused by temporary overload of said transport link.

Knightly discloses a method for performing measurement-based admission control using peak rate envelopes including the following features.

Regarding claim 4 and 25, wherein said step of checking whether said traffic mix is contained within said non-linear overload-limited admissible region is representative of checking whether or not said traffic mix violates a delay requirement related to packet loss caused by temporary overload of said transport link (see “take care that the total amount of traffic…does not exceed a certain level which could cause buffer overflow…thereby resulting in either violation of packet loss or delay promises" recited in column 2, lines 8-16).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Sabry, Andrews and Racz using features, as taught by Knightly, in order to ensure the QoS contract regarding packet loss could be satisfied.

Allowable Subject Matter

7. Claim 20-21 and 41-42 are allowed.

8. The following is an examiner's statement of reasons for allowance: claimed formula not found in prior art references.

9. Methods similar to those in the claimed used to determine the admissible regions were found in the background section of the current application and the cited prior arts (such comparing total link capacity to the sum of estimated effective bandwidth of each connection on the link). However, none of which shows the all of the specific element disclosed in the formula.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

10. Claims 5-9, 11-18, 26-30 and 32-39 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. The following is a statement of reasons for the indication of allowable subject matter: claimed formula not found in prior art references.

12. Methods similar to those in the claimed used to determine the admissible regions were found in the background section of the current application and the cited prior arts (such comparing total link capacity to the sum of estimated effective bandwidth of each connection on the link). However, none of which shows the all of the specific element disclosed in the formula.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JUTAI KAO whose telephone number is (571)272-9719. The examiner can normally be reached on Monday ~Friday 7:30 AM ~5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kwang Yao can be reached on (571)272-3182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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